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EVALUATION OF THE SOUTHERN PINE BEETLE INFESTATIONS ON THE TENAHA DISTRICT, SABINE NATIONAL FOREST, TEXAS

by

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INTRODUCTION

An aerial photographic survey and subsequent ground examinations were conducted on the Sabine National Forest during July and August 1974. The survey, which covered the Tenaha Ranger District (219,120 acres), was performed by the Forest Pest Management Group to determine the current status and trend of the southern pine beetle populations on the District.

The southern pine beetle infestations on this District are part of a southwide outbreak involving 10 states. Southern pine beetle was first detected on the Forest in 1966. Since that time, population levels have fluctuated between endemic and outbreak levels.

METHODS

A 17 percent aerial photographic survey, utilizing 800 acre sample plots (Figure 1), was performed in accordance with Southeastern Area guidelines[1/].

A portion of the spots detected during the aerial phase of the evaluation was examined on the ground to confirm the cause of mortality, the percent of spots that are active and to assess the general condition of beetle populations.

TECHNICAL INFORMATION

Insect - Southern pine beetle, *Dendroctonus frontalis*, Zimm.

Hosts - The southern pine beetle will attack all species of southern yellow pine. However, loblolly pine, *Pinus taeda* L., and shortleaf pine, *P. echinata* Mill., are the preferred hosts.

1/ Evaluating SPB Infestations, 1970, USDA, USFS, SA, S&PF, Division of FPM, Pub. FPM-8, Atlanta, Georgia. 35 pp.

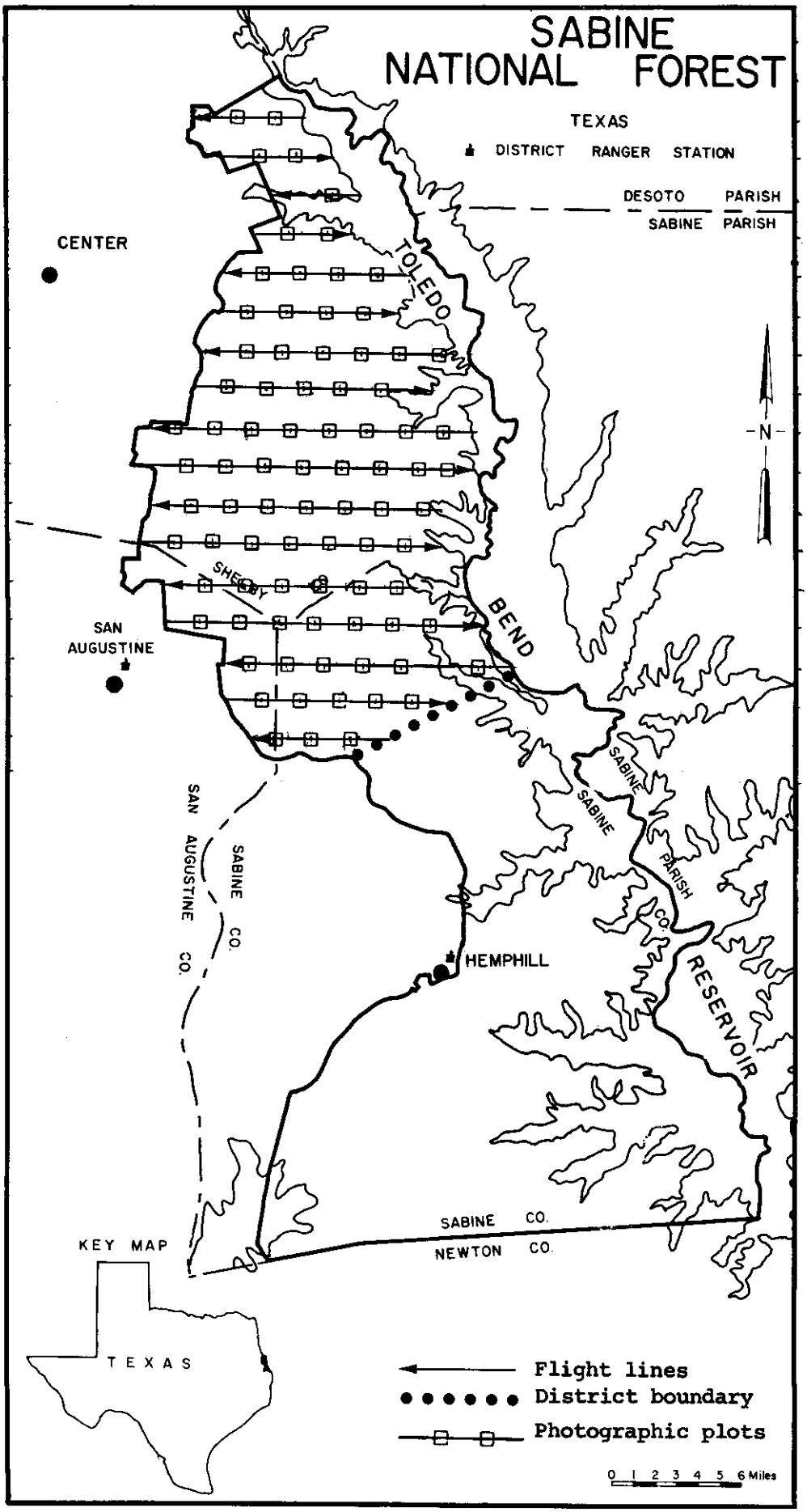

Figure 1. Survey map, southern pine beetle evaluation on Tenaha District, Sabine National Forest, Texas, July 1974.

Type of Damage - Death of the tree is the result of cambial mining by the southern pine beetle as it constructs its gallery. The beetle also introduces the blue stain fungi, *Ceratocystis* spp., which slows down or blocks conduction of water in the stem.

Life cycle of the beetle - The beetles attack in pairs and construct a winding gallery in the cambium. Eggs are deposited in niches along the sides of the galleries. The eggs hatch into whitish grubs that further mine the cambium and then construct cells in the bark for pupation. The callow adults then mine through the bark to emerge. The complete life cycle takes about a month during the summer and as many as seven generations may be produced in a year.

RESULTS AND DISCUSSION

The southern pine beetle population is presently at a moderate level (2.04 infested trees/M acres) on the Tenaha Ranger District. This reflects an increase in the population level from that reported in the evaluation conducted during the spring of 1974. Terry, et al., (1974) reported that the May 1973 evaluation indicated low levels of infestations, however, in late summer and early fall populations increased. Populations were again low in April 1974.

Tables 1 and 2 summarize the results for the District.

The following is a brief narrative discussion of ground observations on the District

Tenaha District,
Sabine National Forest, Texas

Thirty-eight percent of the spots examined during the ground check were infested with southern pine beetle. Brood densities of 83 insects per square foot of bark surface and a green infested to red infested tree ratio of 0.0:1 indicate that populations will probably remain at current levels and are not expected to increase drastically.

RECOMMENDATIONS

Population levels were moderate on the Tenaha District. It is recommended that the District continue to apply suppressive measures for southern pine beetle in accordance with the Southern Pine Beetle Control Plan for the National Forests of Texas and FSM 5250. Project funds for second half FY 1975 should be continued.

Table 1.--Results of southern pine beetle evaluation on the Tenaha District, Sabine National Forest, Texas, July 1974

1. Results compiled from data collected during the aerial phase of the evaluation

Survey type	Photographic
Date of survey	July 22, 1974
Percent survey	17
Total acreage surveyed	219,120
Total susceptible host type acreage	163,124
Total number of spots within survey boundary	1,041
Spots per M acres of host type	6.38
Average spot size (trees)	3.33
Range of spot sizes (trees)	1 - 51
Reds and faders per M acres of host type	21.24

2. Results compiled from data collected during ground and aerial phases of the evaluation

Date of ground phase	Aug. 14, 1974
Infested trees per M acres host type	2.04
Total number of infested trees	333
Total number of affected[1/] trees	2,892
Brood density (brood per square foot)	83.30
Infested green to infested red tree ratio	0.0 : 1
Volume of infested pulp	72.0(CCF)
Volume of infested sawtimber	30.0(MBF)
Volume of affected pulp	83.0(CCF)
Volume of affected sawtimber	241.0(MBF)
Percent of spots infested	38.0%

1/ Affected means attacked and/or killed.

Table 2.--Summary of aerial photographic survey data - southern pine beetle evaluation, Tenaha District, Sabine National Forest, Texas, July 1974

	Infestation Size (No. of Trees)[1/]							
	Single	2-5	6-20	21-50	51-100	100+	Total	Average Mult. Tree Spot Size
Spots	476	429	118	12	6	0	1041	5.29
Trees	476	1206	1176	306	300	0	3465	

[1/] Data corrected according to Aldrich et al., 1958 (expanded to 100 percent survey area coverage).

REFERENCES

Aldrich, R. C., R. C. Heller, and W. F. Bailey. 1958. Observation limits for aerial sketch mapping southern pine beetle in the southern Appalachians. Jour. For. 56(3):200-202.

Terry, J. R. et al. June 1974. Evaluation of southern pine beetle infestations on the Angelina and Sabine National Forests in Texas. USDA, Forest Service, SA, S&PF, Forest Pest Management Group, Rept. No. 74-2-8.